

Can we trust that they will bust? - Boom-bust dynamics in biological invasions

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Invasive alien species (IAS) - species that have been introduced accidentally or deliberately by humans into a natural environment outside their native distribution and are causing or are likely to cause environmental or economic harm - are one of the greatest threats to global biodiversity.

Prevention and management of IAS are therefore of the utmost importance. However, the populations of some IAS have shown boom-bust dynamics - a drastic decrease after having risen to outbreak levels - giving rise to scepticism among some stakeholders regarding the necessity of management.

We conducted a Web of Science analysis to investigate the prevalence of IAS boom-bust population dynamics, and underlying trends and mechanisms. We found 56 papers on IAS describing population dynamics that might be classified as boom-bust.

As thousands of populations of IAS are established worldwide, and hundreds of scientific IAS papers are published every year, the boom-bust phenomenon appears to be rather rare. It does occur in some cases and can have many different causes. Enemy release followed by enemy accumulation was the main mechanism given in boom-bust papers, as predator-prey, diseases/parasites and competition were among the top-ranking mechanisms. Other important mechanisms included changes in inorganic factors, human influence and resource depletion. Exceptional cases of boom-bust should not be used as an excuse for not managing IAS.